Status of Gypsy Moth Populations at Walter Reed Hospital Annex and Walter Reed Army Medical Center 1987-88

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STATUS OF GYPSY MOTH POPULATIONS AT WALTER REED HOSPITAL AND WALTER REED HOSPITAL ANNEX, 1987-88

ABSTRACT

Interpretation of egg mass survey data indicates that gypsy moth populations are at relatively low levels within the Walter Reed Army Medical Center and only scattered light defoliation (less than 30 percent) is anticipated in 1988. Sufficient gypsy moth populations exist within the Walter Reed Hospital Annex to cause heavy defoliation (60-100 percent) in 1988.

INTRODUCTION

The Maryland Department of Agriculture tentatively plans to treat an area in Forest Glen Park adjacent to the northern border of the Walter Reed Annex for the control of gypsy moth in 1988. To accommodate their efforts, the USDA Forest Service was asked about information regarding the status of gypsy moth populations within the Walter Reed Hospital Annex. During the course of their surveys, they noticed that the gypsy moth infrstation extended onto the grounds of the Walter Reed Hospital Annex. Since the USDA Forest Service conducts detection and evaluation surveys of forest tree pests on Federal lands, we were advised of the situation and asked to relay such to the appropriate office at Walter Reed Hospital Annex.

On September 15 and November 24, 1987, USDA Forest Service personnel conducted gypsy moth egg mass surveys at Walter Reed Hospital Annex and Walter Reed Army Medical Center. The results of the surveys are presented in this report along with some recommendations.

METHODS

Gypsy moth survey plots were randomly selected based on available host trees (oaks), size of sample areas, uniformity between egg mass counts, and available time. At each sample point, the total number of new egg masses was observed and recorded. When appropriate, a 1/40th acre fixed-radius plot was conducted in order to compute the number of egg masses per acre.

The fixed-radius plots (radius 18.6 feet) consisted of a tally of all the newly laid (1987) egg masses observed on the overstory trees, understory vegetation, ground litter and duff. The total egg masses observed for each plot was the multiplied by 40 to determine egg masses per acre using the following equation:

$$Y = 40X$$

where,

Y = egg masses per acre
X = number of egg masses observed in the plot

RESULTS

Walter Reed Hospital Annex

A total of nine 1/40 acre survey plots was established within the Walter Reed Hospital Annex. Table 1 shows the results by survey point. Figure 1 shows the general location of each plot. Gypsy moth egg mass densities averaged 2263 and ranged from 240-6840 egg masses per acre.

Walter Reed Army Medical Center

New egg masses were observed on trees in 12 general locations. Table 2 lists the number of egg masses observed and describes the general locations. Figure 1 shows the general location of the observations. A total of 60 egg masses was observed, which ranged from 0-18 egg masses per area.

DISCUSSION

The gypsy moth is subject to physical and biological factors that act to regulate population numbers. The effect of availability and suitability of food, site conditions, incidence of natural control factors (predators and parasites), inter- and intra-specific competation, weather effects as well, other influences cannot be predicted at this time. The basic data used in this report to estimate the defoliation potential in 1988 includes an evaluation of the past defoliation history of the area in question, the number of egg masses/acre, the size and condition of the egg masses, the available preferred food, the terrain, and the risk of larval blow-in following egg hatch. Potential defoliation is categorized as follows: light (1-30 percent); moderate (31-60 percent); and heavy/severe (61-100 percent).

The results of the egg mass surveys indicate that there are sufficient resident gypsy moth popultions to cause heavy defoliation in the Walter Reed Hospital Annex area. However, we do not anticipate any more than scattered, light (if noticeable) tree defoliation at the Walter Reed Army Medical Center.

The specific gypsy moth management objectives for either facility are not known to us. However, we have nevertheless developed and presented three management options for your consideration. These options assume the following objectives: 1) protecting host tree foliage; 2) preventing tree mortality; and, 3) reducing gypsy moth populations. Each is discussed below.

No Treatment Option

It is possible for gypsy moth populations to collapse naturally due to NPV (nucleopolyhedrosis virus), but we are not able to evaluate that likelihood with the information on hand. In any event, it is unlikely that this would happen prior to some degree of defoliation occurring in areas containing more than 250 egg masses per acre. Should light-moderate defoliation occur, only a temporary loss in tree growth and possible larval nuisance in public areas

will occur. Should heavy defoliation occur, however, some branch dieback and tree mortality is likely, depending upon tree condition at the time of defoliation. Trees of the highest risk are those that are presently stressed from other factors, such as: 1) past defoliation; 2) soil compaction due to sidewalks, parking lots, machinery and/or heavy foot travel; 3) over maturity; 4) drought; 5) shock due to recent harvest exposures; and 6) other insect or disease related problems.

Chemical Insecticide Option

Dimilin[R] (diflubenzuron) is the most widely used chemical used in State supported suppression projects for the control of gypsy moth populations throughout the Northeast, Diflubenzuron is an insect growth regulator that disrupts the normal molting processes of immature larvae. The mode of action is by inhibiting the formation of chitin, a necessary component of the outer cuticle which causes the affected larvae to die during the molt following treatment. The method of uptake is primarily by ingestion, however, recent research has indicate the possibility of absorption through the cuticle as well. Dimilin[R] is available as a 25 percent wettable powder formulation, and the recommended application rate is 1-4 ounces per acre applied in one treatment. With proper application, foliage protection and population reduction of about 95 percent can be expected. Dimilin[R] is considered extremely toxic to aquatic invertebrates and should not be applied to water or wetlands.

Microbial Insecticide Option

The third option is to use a microbial insecticide to manage gypsy moth populations. The only biological insecticide currently available for gypsy moth control is a microbial insecticide based on the bacterium Bacillus thuringiensis variety kurstaki. This insecticide has been used extensively in State-sponsored suppression projects throughout the Northeast in both forested and residential areas. B.t. acts specifically against lepidopterous larvae as a stomach poison and therefore must be ingested. The major mode of action is by mid-gut paralysis which occurs soon after feeding. This results in a cessation of feeding, and death by starvation.

B.t. formulations are available as flowable concentrates, wettable poweders, and emulsifiable suspensions. The normal application rates range from 12-20 BIUs per acre in each of one or more treatments. With proper application, foliage protection and population reductions of about 70 percent can be expected for each application.

Alternatives

With the previously described options in mind, the following 7 alternatives have been developed.

Alternative 1. -- No action.

Alternative 2. -- Single application of Dimilin^{R} applied aerially at the rate of 2 ounces (formulated material) in 128 ounces of water per acre.

Alternative 3. -- Ground application of Dimilin^{R} at the same rate as that discussed in Alternative 2, but diluted such that the total mixture applied provides adequate coverage of the foliage without excessive runoff.

Alternative 4. -- A single aerial application of B.t. applied at the rate of 12-20 BIUs per acre in 1.0 gallons per acre total mix. An appropriate spreader/sticker should be added at the rate of 2 percent by volume.

Alternative 5. -- Two aerial applications of B.t. at the same rate as that discussed in Alternative 4. The second application should be applied 7-10 days following the first.

Alternative 6. -- Ground application of B.t. at the same rate as that in Alternatives 4 and 5, but diluted such that the total amount applied provides adequate coverage of tree foliage without excessive runoff.

Alternative 7. -- Same as Alternative 6, except two applications are made; the second 7-10 days following the first.

RECOMMENDATIONS BY SITE

Walter Reed Hospital Annex

Gypsy moth populations on site are high enough to cause heavy defoliation this spring. As a result, some action will need to be taken in order to protect tree foliage, reduce gypsy moth populations, and to prevent the area from becoming a source of reinfestation into adjacent neighborhoods. The most effective alternative to implement under these conditions is:

Alternative 2 or 5.

To a lessor degree, the following alternatives may provide varying degrees of effectiveness:

Alternatives 4, 3, 7, and 6

If appropriate, it would be logistically advantageous and as effective to see if The Maryland Department of Agriculture would incorporate the Annex in the treatment area planned for Forest Glen Park.

Walter Reed Army Medical Center

Although we were not able to sufficiently quantify gypsy moth populations within the Walter Reed Army Medical Center, we do not anticipate more than light scattered tree defoliation this spring. We recommend no action be taken (Alternative 1).

Table 1.--Gypsy Moth Egg Mass Survey Results at Walter Reed Hospital Annex, November 24, 1987.

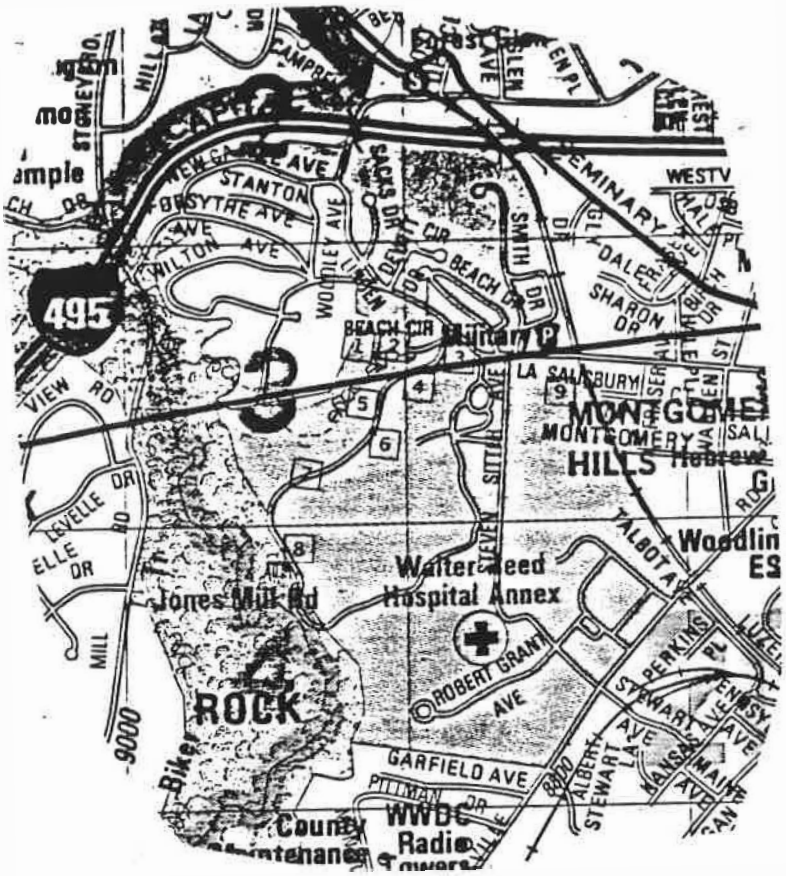
Plot #	Survey Method	Egg Masses/Acre
1	1/40 acre plot	6840
2	1/40 acre plot	5160
3	1/40 acre plot	800
4	1/40 acre plot	960
5	1/40 acre plot	880
6	1/40 acre plot	1400
7	1/40 acre plot	440
8	1/40 acre plot	240
9	1/40 acre plot	3640

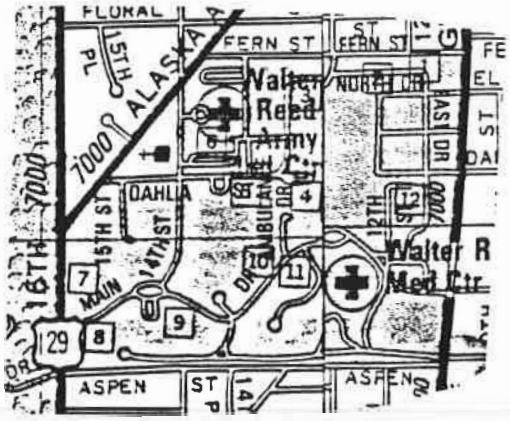
Average = 2263 EM/A

Table 2.--Gypsy Moth Egg Mass Survey Results, Walter Reed Army Medical Center, September 15, 1987.

Observation Number	Location of Observations	Number of Egg Masses Observed
1	Small Trees Northeast of Hospital Building	2
2	Two Big Willow Oaks North of Hospital Building	1
3	Trees West of Hospital Building	1
4	Trees in Front of Building #54	3
5	Trees Around Church	18
6	Trees Across Road from Church	9
7	Trees in Lawn North of Gate on 16th Street	2
8	Trees in Lawn South of Gate on 16th Street	4
9	Trees Between Building #40 and #G76	16
10	Trees Between Building #11 and #91	0
11	Trees in Parking Lot Island Between Building #G76 and #11	3
12	Trees Between Building #90 and #14	1

Figure 1.- Gypsy Moth Egg Mass Survey Plot Locations at Walter Reed Hospital Annex and Walter Reed Army Medical Center, September 15 and November 24, 1987.





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January 19, 1988

Mr. Razi Fasihi, Chief
Planning and Environmental Division
Room G16, Bldg. 1
Walter Reed Army Medical Center
Washington, DC 20307-5001

Dear Mr. Fasihi:

Enclosed for your information are the results of our gypsy moth egg mass surveys conducted at Walter Reed Hospital Annex and Walter Reed Army Medical Center. In Summary, gypsy moth populations are sufficient to cause heavy defoliation (61-100 percent) at the Walter Reed Hospital Annex. We do not anticipate more than light defoliation (1-30 percent) on scattered trees at Walter Reed Army Medical Center.

In the report, we recommend an aerial application of Bacillus thuringiensis (B.t.) or Dimilin at the Walter Reed Hospital Annex and no action at the Walter Reed Army Medical Center. The Maryland Department of Agriculture tentatively plans to conduct a gypsy moth suppression project in the Forest Glen Park area in 1988. It may be efficient and logistically advantageous if you could coordinate with this agency to be included in their treatment plans. If you are interested in pursuing this avenue, you should contact Betsie Handley, Maryland Department of Agriculture, Gypsy Moth Control Office, Mt. Airy, MD. She can be reached at 301-829-9116.

Please feel free to call Brad or me if you have any questions regarding the survey report. We would be happy to work with you and the Maryland Department of Agriculture to accommodate your treatment plans.

Sincerely,

NOEL F. SCHNEEBERGER
Entomologist
Forest Pest Management

cc: AO
Ben Pagac, Fort Meade, MD
Col. Marshall, Director of Housing
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NFS/BPO/gjh